

Message Text

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ORIGIN IO-14

INFO OCT-01 EUR-12 ISO-00 OES-07 SS-15 FEA-01 ERDA-05
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NSC-05 OMB-01 PM-04 USIA-06 SP-02 STR-04 TRSE-00
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APPROVED BY EUR:JAARMITAGE
OES/NET/RD:JDEVINE
T:EMCGAFFIGAN
OES/NET:LNOSENZO (SUBSTANCE)
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R 092107Z JUN 77
FM SECSTATE WASHDC
TO AMEMBASSY BUCHAREST
INFO AMEMBASSY PARIS
AMEMBASSY VIENNA

C O N F I D E N T I A L STATE 133712

PARIS FOR NYE AND NOSENZO, VIENNA FOR IAEA

E.O. 11652: GDS

TAGS: PARM, TECH, MNUC

SUBJECT: INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION

1. FOLLOWING IS PAPER OUTLINING THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION PROGRAM.

2. BEGIN TEXT. THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION (A POSSIBLE APPROACH).

A. THE OBJECTIVES OF THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION
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CYCLE EVALUATION ARE TO:

-- ENHANCE INTERNATIONAL COOPERATION IN DEALING WITH COMMON CONCERNS RELATED TO THE USE OF NUCLEAR POWER FOR CIVIL PURPOSES AND PROVIDE A FORUM FOR EXCHANGE OF VIEWS AND VOLUNTARY HARMONIZATION OF POLICY, AND

-- PROVIDE INFORMATION TO GUIDE THE DEVELOPMENT OF ALTERNATIVE NUCLEAR POWER SYSTEMS THAT MINIMIZE POTENTIAL PROLIFERATION WHILE ASSURING RELIABLE ECONOMIC AND EN-

VIRONMENTALLY ACCEPTABLE ENERGY SUPPLIES FOR EACH NATION. THE PROGRAM WILL IDENTIFY AND ASSESS THE FEASIBILITY OF ALTERNATE SYSTEMS TO MEET ENERGY NEEDS ON A TIMELY BASIS.

B. EACH PARTICIPATING COUNTRY AND INTERNATIONAL ORGANIZATION WOULD CONTRIBUTE TO THE OBJECTIVES SET FORTH IN PARAGRAPH 1 ABOVE BY APPLYING SCIENTIFIC, TECHNICAL AND FINANCIAL RESOURCES, ALONE OR IN COOPERATION WITH OTHERS AS IT DEEMS APPROPRIATE, TO PROGRAMS AND PROJECTS COMMONLY IDENTIFIED AS USEFUL IN THE EVALUATION.

C. THE PARTICIPANTS COULD DESIGNATE NATIONAL AGENCIES OR OTHER PUBLIC OR PRIVATE ORGANIZATIONS AS THE VEHICLE FOR THEIR CONTRIBUTION TO THE EVALUATION.

D. THE EVALUATION PROGRAM WILL CONSIST OF A NUMBER OF COORDINATED RESEARCH AND STUDY PROGRAMS RELATED TO EXISTING FUEL CYCLES AND FUTURE CYCLE ALTERNATIVES. COUNTRIES AND INTERNATIONAL ORGANIZATIONS INTERESTED IN PARTICIPATING IN RESEARCH AND EVALUATION IN A PARTICULAR AREA WILL WORK TOGETHER. ONE OR MORE OF THE PARTICIPANTS, AS AGREED AMONG THEMSELVES, WOULD BE DESIGNATED AS THE LEAD PARTICIPANTS, I.E. RESPONSIBLE FOR ARRANGING MEETINGS AND COORDINATING WORK IN THE PARTICULAR AREA. THE OVERALL EVALUATION WILL BE COORDINATED
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THROUGH PARTICIPATION IN A STEERING COMMITTEE WHICH WOULD MEET TO LAUNCH THE PROGRAM AND PERIODICALLY TO ASSESS PROGRESS. THE STEERING COMMITTEE CAN CONSIST OF REPRESENTATIVES OF LEAD PARTICIPANTS AND OTHER PARTICIPATING COUNTRIES AS WELL AS REPRESENTATIVES OF INTERNATIONAL ORGANIZATIONS WITH A MAJOR INTEREST IN THE EVALUATION.

E. DISCUSSION OF AN OVERALL INFCE PLAN AND SCHEDULE SHOULD TAKE PLACE IN THE NEXT FEW MONTHS. WE WOULD HOPE THAT IDENTIFICATION OF LEAD PARTICIPANTS AND JOINT EXAMINATION OF A WORK PLAN FOR EACH MAJOR AREA COULD PROCEED IN PARALLEL, WITH WORK IMPLEMENTATION IN SOME AREAS BEGINNING IN EARLY FALL. AT THIS JUNCTURE, THE U.S. BELIEVES THERE WOULD BE MERIT IN LAUNCHING THE PROGRAM THROUGH A STEERING COMMITTEE MEETING THAT WOULD DIRECT VARIOUS TECHNICAL WORKING GROUPS TO DEFINE AND DEVELOP AREAS OF MUTUAL INTEREST. THESE GROUPS WOULD REPORT BACK TO THE STEERING COMMITTEE. WE WOULD EXPECT THE GENERAL REVIEW OF RESULTS AND DISCUSSION OF FURTHER WORK IN ABOUT TWO YEARS. INCLUDING A POSSIBLE PRIORITIZING OF ITEMS FOR FURTHER DEVELOPMENT.

F. THE WORK OF THE EVALUATION WOULD BE COORDINATED WITH AND MAKE USE OF THE CAPABILITIES OF THE IAEA. THE IAEA

COULD BE REPRESENTED ON THE STEERING COMMITTEE. THE RESULTS OF WORKING GROUPS WOULD BE FED INTO THE IAEA PROGRAM THROUGH SYMPOSIA AND PUBLICATIONS. IAEA EXPERTS COULD PARTICIPATE IN WORKING GROUPS AND MIGHT FUNCTION

AS LEAD PARTICIPANTS IN SOME AREAS. PERIODIC OVERALL REVIEWS COULD TAKE PLACE UNDER IAEA AUSPICES. THE CAPABILITIES OF OTHER ORGANIZATIONS COULD BE APPLIED AS APPROPRIATE.

G. PARTICIPATING NATIONS WOULD, IN ACCORDANCE WITH THEIR OWN INTERESTS AND PROGRAMS, UNDERTAKE AND CO-CONFIDENTIAL

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ORDINATE RESEARCH AND EVALUATION IN THE FOLLOWING SPECIFIC AREAS, AND OTHERS AS IDENTIFIED BY THE PARTICIPANTS.

(1) AN INTERNATIONAL ASSESSMENT OF URANIUM AVAILABILITY AND DEMAND TAKING INTO ACCOUNT THE WORK ALREADY BEING PERFORMED BY THE IEA AND NEA. THIS WOULD INCLUDE CONSIDERATION OF COORDINATED EXPLORATION, JOINT RESOURCE DEVELOPMENT, AND MEASURES TO FACILITATE EXPORT/IMPORT ARRANGEMENTS CONSISTENT WITH PRUDENT NON-PROLIFERATION CONDITIONS. DIFFERING MARKET REGIMES AND INTERACTION WITH COMMERCIAL ISSUES WOULD BE TAKEN INTO ACCOUNT. A PARALLEL STUDY ON THORIUM COULD ALSO BE UNDERTAKEN.

(2) INVESTIGATION OF SOUND MINING TECHNIQUES FOR RECOVERY OF LOWER GRADE ORES.

(3) AN EVALUATION AMONG INTERESTED STATES OF URANIUM ENRICHMENT REQUIREMENTS AND PROJECTED CAPACITY. THIS WOULD INCLUDE CONSIDERATION OF JOINT PLANNING TO ENSURE ADEQUATE CAPACITY AND OF COLLABORATIVE INVESTMENT OPPORTUNITIES.

(4) AN EXAMINATION OF POSSIBLE INSTITUTIONAL ARRANGEMENTS DESIGNED TO ASSURE LONG-TERM FUEL SUPPLY. THIS WILL INCLUDE ANALYSES OF SUCH ARRANGEMENTS AS BILATERAL SUPPLIER-CONSUMER GUARANTEES, MULTINATIONAL ARRANGEMENTS THAT WOULD PERMIT CONSUMER INVESTMENT IN ENRICHMENT SERVICES, AND FUEL POOLING, ALL AIMED AT INSURING ACCESS ON A NON-DISCRIMINATORY BASIS TO REACTOR FUEL TO COUNTRIES MEETING MUTUALLY AGREED NON-PROLIFERATION CONSTRAINTS.

(5) AN EXAMINATION OF DEMAND AND ASSURED SUPPLY ARRANGEMENTS FOR HEAVY WATER.
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(6) COORDINATED RESEARCH, INFORMATION EXCHANGE AND TECHNICAL AID IN FOSTERING NEAR-TERM OPTIONS FOR INCREASING SPENT FUEL STORAGE INCLUDING TECHNOLOGIES FOR

MORE EFFICIENT UTILIZATION OF EXISTING SPENT FUEL CAPACITY (E.G. NEUTRON ABSORBING RACKS) AND TECHNOLOGIES FOR RAPIDLY INSTALLING ADDITIONAL CAPACITY. STUDIES DESIGNED TO FACILITATE THE SAFE AND ECONOMICAL TRANSPORTATION OF SPENT FUEL AND RADIOACTIVE WASTES.

(7) POSSIBLE ESTABLISHMENT OF INTERNATIONAL SPENT FUEL REPOSITORIES, INCLUDING STUDIES ON A REGIONAL BASIS TO ASSESS SITES FOR SUCH REPOSITORIES AND DEVELOP LEGAL, FINANCIAL AND INSTITUTIONAL FRAMEWORKS FOR BRINGING SUCH REPOSITORIES INTO EXISTENCE.

(8) STUDIES ON LONG-TERM RETRIEVABLE STORAGE. THIS WOULD INCLUDE CONSIDERATION OF VARIOUS RESEARCH CONCEPTS AND COMPARISON OF EXPERIMENTAL RESULTS ON ONGOING RESEARCH ON RETRIEVABLE STORAGE TECHNOLOGIES.

(9) WORK ON THE TECHNOLOGY FOR PERMANENT STORAGE OF SPENT FUEL OR HIGH LEVEL WASTE, INCLUDING DISPOSAL CANISTER DESIGN AND TESTING. JOINT CONSIDERATION OF INTERNATIONAL REPOSITORIES WOULD ALSO BE UNDERTAKEN.

(10) A SYSTEMATIC ASSESSMENT OF THE COMPARATIVE ADVANTAGES OF VARIOUS REACTOR AND FUEL CYCLE CONCEPTS, TAKING INTO ACCOUNT RELEVANT CRITERIA PERTAINING TO NON-PROLIFERATION BENEFITS, TECHNICAL FEASIBILITY, ECONOMIC IMPLICATIONS, AND PROSPECTIVE USEFULNESS IN MEETING ENERGY NEEDS.

(11) RESEARCH ON VARIOUS TECHNICAL METHODS TO INCREASE ONCE-THROUGH URANIUM UTILIZATION IN LWRS AND HWRS,
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SUCH AS OPTIMIZED FUEL AND LOADING DESIGNS AND SPECTRAL SHIFT MODIFICATIONS THAT WOULD SIGNIFICANTLY INCREASE FUEL UTILIZATION AND REACTOR EFFICIENCY.

(12) RESEARCH PROGRAMS ON ADVANCED REACTORS, BREEDER ALTERNATIVES AND THORIUM USE, INCLUDING:

-- HTR ONCE-THROUGH APPLICATIONS USING LOW-ENRICHED URANIUM;

-- HTR THORIUM/URANIUM DENATURED FUEL CYCLE APPLICATIONS;

-- VARIOUS BREEDER CONCEPTS, INCLUDING LIGHT WATER, THORIUM, SODIUM, AND GAS-COOLED BREEDERS, PARTICULARLY THOSE CONCEPTS WHICH, WHILE REQUIRING SENSITIVE FUELS

AND FUEL CYCLE ELEMENTS, WOULD ALSO SUPPORT EXISTING OR FUTURE NON-SENSITIVE REACTOR CYCLES;

-- OTHER ADVANCED REACTOR CONCEPTS, INCLUDING RESEARCH ON REACTOR POSSIBILITIES THAT ARE IN THE CONCEPTUAL RATHER THAN EXPERIMENTAL STAGE, SUCH AS PARTICLE ACCELERATOR/REACTOR CONCEPTS, HOMOGENEOUS REACTORS, PLASMA REACTORS AND HYBRID FISSION/FUSION REACTOR CONCEPTS.

(13) EFFORTS IN THE AREA OF REPROCESSING AND RELATED TECHNICAL ALTERNATIVES INCLUDING:

-- ANALYTICAL STUDIES OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF REPROCESSING AND RECYCLE, INCLUDING THE RESULTS OF EXTENSIVE RECENT U.S. WORK ON THE ECONOMIC AND ENVIRONMENTAL AFFECTS OF REPROCESSING AND RECYCLE.

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-- TECHNICAL ALTERNATIVES TO REPROCESSING TECHNIQUES WHICH PRODUCE PLUTONIUM IN A PURE FORM, TO INCLUDE INTERNATIONAL EVALUATION OF THE NON-PROLIFERATION, SAFEGUARDS, PHYSICAL PROTECTION AND ECONOMIC IMPLICATIONS OF TECHNIQUES SUCH AS URANIUM SEPARATION ONLY. VARIOUS COPROCESSING MODES, PYRO-CHEMICAL PROCESSING, AND THOREX REPROCESSING EVALUATION. (THE NON-PROLIFERATION AND OTHER IMPLICATIONS OF THE USE OF CONVENTIONAL REPROCESSING AND PLUTONIUM-HANDLING TECHNIQUES WOULD BE EMPLOYED AS A FRAME OF REFERENCE IN ASSESSING THE VALUE OF ALTERNATIVES.)

-- WITH REGARD TO REPROCESSING OR OTHER PROCESSES INVOLVING PRODUCTION AND USE OF WEAPONS-USABLE MATERIAL, AN EXAMINATION OF THE PROBLEMS ASSOCIATED WITH ATTEMPTING TO SAFEGUARD OR BETTER PROTECT THEM AND EVALUATION OF POSSIBLE FUTURE INTERNATIONAL ARRANGEMENTS TO REDUCE PROLIFERATION RISKS ASSOCIATED WITH ABROGATION OR TERMINATION OF SAFEGUARDS. END TEXT. VANCE

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